

Dolphin, The Difference in Water Treatment



Rebuild Hawaii
February 14th, 2006

Chemfree Hawaii
(808) 262-8443



Points to ponder

- *Water costs to increase 61% (05 – 11)
- *Energy costs predicted to increase 65% (98 – 10)
- *HVAC are 45% – 60% of a buildings energy load.
- *Water cooled chiller plants cost 25% - 60% less than similarly sized air cooled plants.



Discovery of a New Technology

***Proven, patented technology, rigorously tested and evaluated by the Environmental Research Institute at the University of Connecticut.**

*** Biological control originating in the food pasteurization industry and approved by the F.D.A.**

Successful Installations Since 1994

12 years ago the 1st prototypes of a revolutionary chemical free water treatment product were installed at two forward thinking companies.



**Bic Corporation
&
Schick Razors**

Schick Plant in Milford, CT



Schick allowed a complete conversion to the Dolphin Chemical Free Water treatment in 1998

Schick Converted to Dolphin Because...

- *Dolphin *performance* equals or betters the best chemical water treatment
- *The Dolphin System is *cost effective*, reducing the cost of water treatment over the lifetime of the agreement.
- *Keeping chemicals out of the environment is the *right thing to do*.

Understanding Cooling Tower Water Treatment

Problem	No Treatment	Chemicals (A Balancing Act)	Dolphin (Non-Chemical)
Minerals	Scale		
Biological	Disease, Odor & Slime		
Corrosion	Not Too Bad		

Cooling Tower Water Treatment

Problem	No Treatment	Chemicals (A Balancing Act)	Dolphin (Non-Chemical)
Minerals	Scale	Keep in Solution	
Biological	Disease, Odor & Slime	Kill with Poisons	
Corrosion	Not Too Bad	Huge Problems Created, But Try To Fix By Adding Inhibitors	

Cooling Tower Water Treatment

Problem	No Treatment	Chemicals (A Balancing Act)	Dolphin (Non-Chemical)
Minerals	Scale	Keep in Solution	Powder
Biological	Disease, Odor & Slime	Kill with Poisons	Encapsulate
Corrosion	Not Too Bad	Huge Problems Created. Try To Fix By Adding Inhibitors	Very Good

Outdoor Installation on 16 Fluid Coolers at a Peaker Power Plant in CA

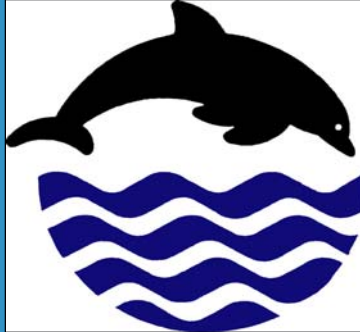


**No Discharge Permitted!
Dolphin Saves the Day**



Dolphin Components

- Coil Pipe Assembly
- Signal Conditioner



Dolphin Performance

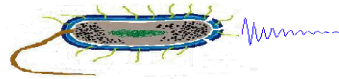
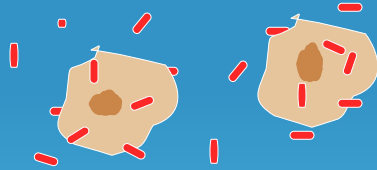
Significant Benefits

- * Controls microbial life
- * Prevents scale from forming
- * Can remove old scale and bio-film
- * Facilitates good corrosion control properties
- * Allows significant savings of water and energy

All Without the Use of Chemicals!

Dolphin Controls Microbial Life Two Methods of Control

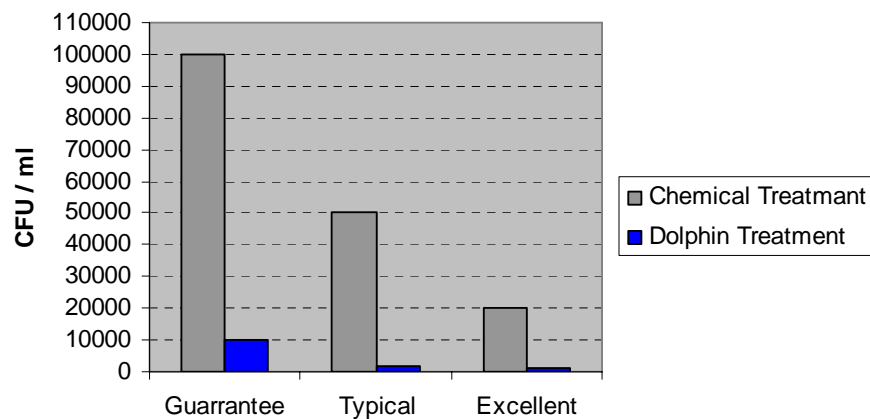
**Encapsulation: Minerals
Coat Bacteria**



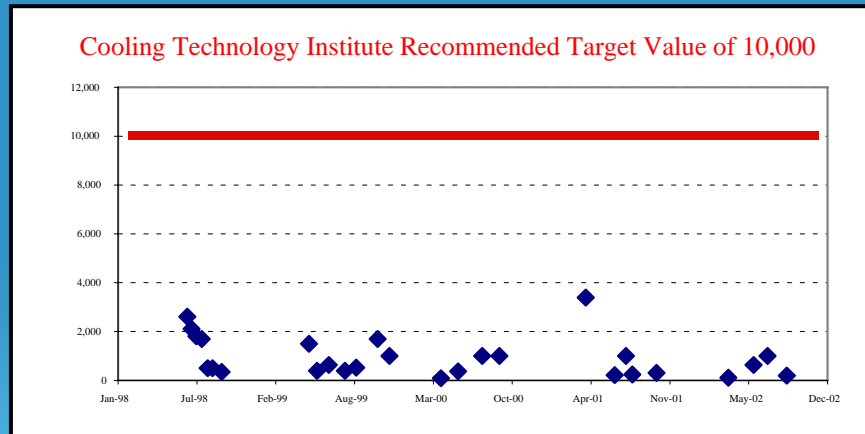
**Electroporation: Pulse
Damages Bacteria
Membranes**

**Both methods prevent bacteria from surviving through
Mutation. There is no build up of chemical resistance.**

Microbial Count Chemical Company Guarantee vs. Dolphin Guarantee

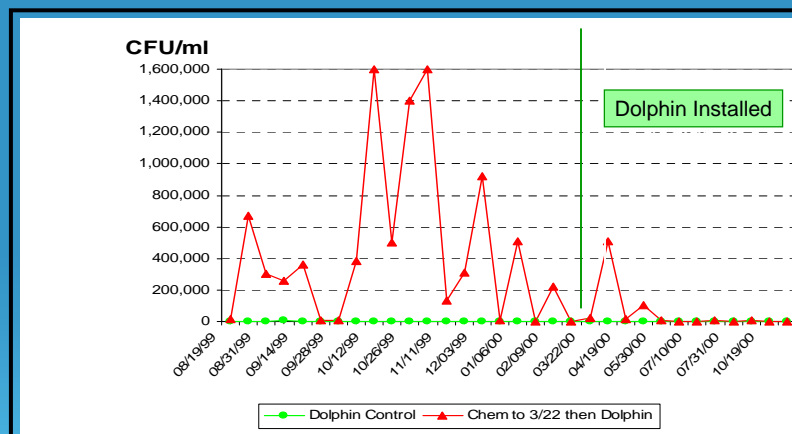


Five Years of Dolphin Control at Alcoa World Headquarters



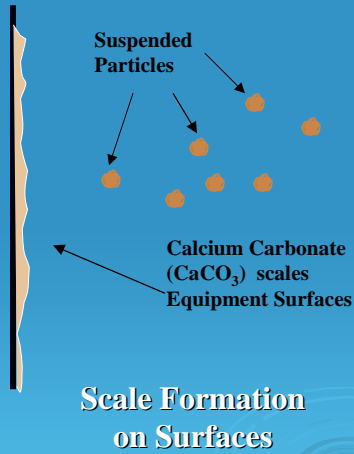
Dolphin Performance Guarantees <10,000 CFU/ml

Superior Biological Control Bic Corporation, Milford, CT



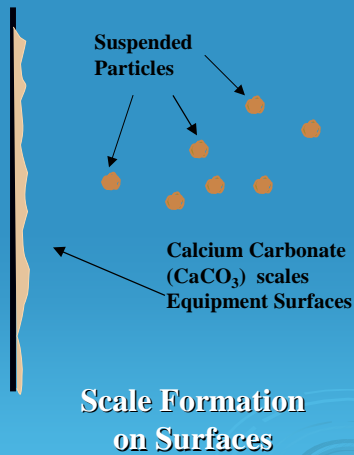
*Scale Prevention - Scale Forms as
Dissolved Minerals Come out of Solution*

No Treatment

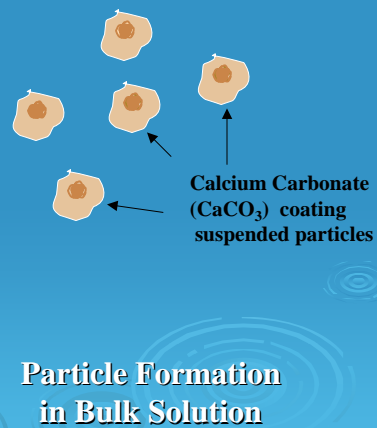


*Dolphin Removes Surface Charges on Suspended
Particles to Prevent Scale on Surfaces*

No Treatment



Dolphin Treatment



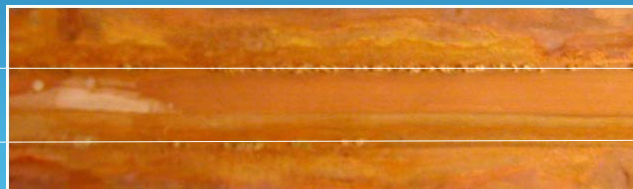
Lab Evaluation - Ashrae Protocol

No-Treatment



Heat
Transfer
Area

Pulsed Power Treatment



Heat
Transfer
Area

Excellent Corrosion Performance

Localized Corrosion

No Microbial Influenced
Corrosion (MIC)

Uniform Corrosion

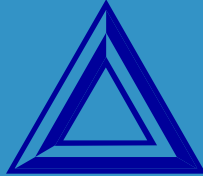
< 0.3 mpy on copper
< 5 mpy on steel

Chemical Corrosion

Biocide corrosion is
avoided

*Dolphin System Performance
Does It All*

Scaling
Control



Corrosion
Control

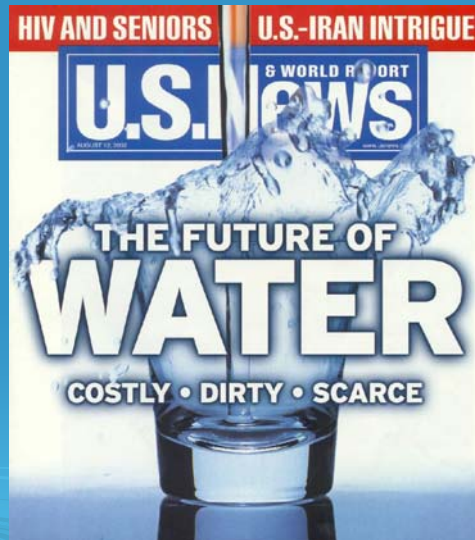
Microbial Control



Economics

Water – A Precious Resource

2000
Began the
Century of
Water



Water Savings on 300-ton System

The Dolphin can save 115,000 gallons per month increasing from 3 Cycles to 6 Cycles.

In many regions Dolphin blowdown can be discharged to ground water at no cost with minimal permitting.

<i>Water Costs</i>	<i>Disposal Costs</i>	<i>Water Savings/month</i>	<i>Disposal Savings/month</i>	<i>Total Savings</i>
<i>Hartford \$1.75/Mgal</i>	<i>Hartford \$1.75/Mgal</i>	\$204	\$204	\$408
<i>Honolulu 2005 \$3.11/Mgal</i>	<i>Honolulu 2005 \$3.90/Mgal</i>	\$357	\$448	\$805
<i>Honolulu 2011 \$5.01/Mgal</i>	<i>Honolulu 2011 \$6.28/Mgal</i>	\$567	\$722	\$1,289

Substantial Cost Savings

- *Savings on energy
- *Savings on maintenance
- *Savings on regulatory compliance
- *Savings on water purchase and disposal
- *Savings on the cost of chemicals & softeners

Cost Savings up Close and Personal

**Good Samaritan
Hospital
Pulyallup, WA**



Facilities manager **Steve Prideaux** calculates:

- a). 12% energy savings
- b). 26% water savings
- c). substantial savings on maintenance, training,
and regulatory compliance

Energy Savings at the Veterans Affairs Medical Center



Complete
conversion to
Dolphin Water
Treatment

Reduced
Operating costs
by 13%

Energy saving of
approximately
5-10%, or about
\$12,000 per year

Installed in 2001



Environmental Benefits

Small Reasons for Choosing Dolphin



Catlin Gabel
Country School

Shawnee Mission
Hospital Day Care
Center



Alcoa World Headquarters



Paul O' Neill, the former Alcoa CEO, was firmly committed to the 'green building' concept.

Dolphin System was installed in 1998.

“It’s The Right Thing to Do”

“I can state that we have had very good success with the non-chemical treatment systems we have specified. We are of the opinion that there are significant advantages associated with such systems, including *environmental benefits, operational economies, and employee safety*. If the systems work, there is really no good reason not to use them. So far, our experiences have indicated that *the Clearwater/Dolphin system works.*”

Herbert J. Brankley, P.E.
Principal, Dodson Engineering
Pittsburgh, PA
Alcoa Design Engineers

“It’s The Right Thing to Do”

The University of California at Davis has converted six cooling towers from chemical treatment to the Dolphin.

John Hahn, assistant superintendent and refrigeration shop supervisor, told *Environmental Building News*,

“We’ve eliminated the chemicals, the cost of the chemicals, and the labor involved with the chemicals; we’ve kept chemicals from going into the water treatment facility on the campus; and the treated water has actually cleaned the bundles and the inner housings. We have 67 cooling towers - *if I had the budget, I’d convert them all right now.*”

“It’s The Right Thing to Do”

“The number of installations of the Dolphin system in the U.S. and Canada since 1998 is approaching 2,000, and **Clearwater Systems has an impressive client list that includes numerous Fortune 100 companies (even one that manufactures cooling-tower chemicals—Dow Chemical), the U.S. Department of Energy, and a score of hospitals, schools, and universities (including Yale).** Even if how it works is confusing and perhaps not entirely proven, the Dolphin Series does seem to offer a great alternative treatment system for recirculation water systems, including cooling towers, boilers, and even display fountains. “

Environmental Building News April 2005

Dolphin Controlled Building Featured in TIME Magazine



August 26th 2002

The hot and wild weather is a sign of things to come. But fresh ideas and new technology can cool us down and make this a **GREEN CENTURY**

PNC Firstside Bank Operations



LEED Silver rated, second largest “green” building
700,000 sq. ft. of critical application
Complete Dolphin control of all water treatment
Dolphin installed in 2000



Dolphin Related LEED Categories



12% of new Construction is planning LEED Certification

Innovation & Design

Water Treatment (Future)

Water Efficiency

Energy & Atmosphere

(Potential in Others)

Dolphin Points make a difference!

Green Buildings Choose Dolphin



Hospitals Choose Dolphin



Schools Choose Dolphin



Colleges and Universities Choose Dolphin



*Many Varied Organizations Choose
Dolphin Water Treatment*



Clean, Clear, Chemical Free Water

**Dolphin
Water
Treatment**



It's The Right Thing To Do

Questions?

